Description of Work
Emerald AOP

Scope of Work:

Emerald AOP: This project is intended to provide the IPNF, St. Joe Ranger District with designs for Aquatic Organism Passage (AOP) drainage structures for two tributaries to the East Fork of Emerald Creek. The consultant will provide the district with a Schedule of Items, Plans, Specifications, and a cost estimate (PS&E) for the following structures.

- One AOP drainage structure for 281 Gulch.
- One AOP drainage structure for Garnet Gulch.

Both structures are located in the SW ¼ of section 8, T.42N, R.1 E, of the Boise Meridian, (see attached project area map, Exhibit 1).

General: Provide site survey, mapping, hydraulic analysis, preliminary design, final design, special project specifications, drawings and construction estimates for replacement of the culverts under Forest Road 447 at 281 Gulch and at Garnet Gulch.

Design Specifications: Design shall be in accordance with the current edition of AASHTO, including any interim specifications. Construction specifications shall be **Forest Service Specifications for Construction of Roads and Bridges, August, 1996.** Drawings and specifications shall be in English Units.

Design Criteria:

Design Loadings:	Per AASHTO (HS-20 Loading).
Design Vehicle:	Lowboy
Design Width:	16’ plus curve widening
Surface:	Crushed Aggregate
Hydraulics:	Design new stream crossing to pass 100-year events (Q100) and maintain velocities comparable to existing channel conditions. Maintain bankfull widths through the new structure by stream simulation that includes stream banks and stream bed based on reference reach conditions. Maintain velocity and stream depth for aquatic organism passage, including juvenile and adult fish during seasonal low flow periods and discharges up to the ten-year event (Q10). Hydraulic analysis shall be completed using one dimensional, steady flow, water surface profile analysis. Acceptable computer models are HEC-RAS or HEC-2.

Preliminary Design Scope of Work:

Emerald AOP

- Complete site survey and develop a site map for replacement of the existing structures.
- Complete a hydraulic analysis.
- Position of the structures, impacts to the stream, (hydraulic, grade control, width/depth etc.) as well as impacts to recreational and commercial traffic shall be presented to the Forest Service for review.
- Prepare budgetary construction cost estimates for any replacement alternatives.

Site Visit, Survey and Preliminary Design Scope of Work:

The site visit with consultant Mike Jensen was conducted on July 24, 2008. Various alternatives were discussed on site for both structures.

281 Gulch:

- **Site Survey**. Stream profile and development of a site map for replacement of the existing culvert.
- Complete a **hydraulic analysis**.
- **Foundation.** No geotechnical site investigation has been completed.
- **The preferred alternative is an embedded concrete box culvert.** Minor alternatives for road alignment and positioning of the drainage structure can be presented to the Forest Service for review during the preliminary design phase of the project. The preferred alternative is the existing road alignment with minor grade change.
- Prepare budgetary construction cost estimates for the preferred alternative or any replacement alternatives.

Garnet Gulch:

- **Site Survey**. Stream profile and development of a site map for replacement of the existing culvert.
- Complete a **hydraulic analysis**.
- **Foundation.** No geotechnical site investigation has been completed.
- **The preferred alternative is an embedded concrete box culvert or super arch with headwalls.** Minor alternatives for road alignment and positioning of the drainage structure can be presented to the Forest Service for review during the preliminary design phase of the project. The preferred alternative is the existing road alignment with minor grade change.
- Prepare budgetary construction cost estimates for the preferred alternative or any replacement alternatives.

Deliverables:

Preliminary Design and Design Alternatives Meeting

- Review materials for a minimum of 4 participants
- 4 hard copies of final site maps (after any review meeting revisions).
- Electronic version of site maps in AutoCAD 2007 to current release.
- A meeting with Forest Service Representatives to discuss design alternatives ***(Meeting to be conducted at the DJ&A office in Missoula, Montana).***

Final Design Scope of Work:

Final design shall include the drainage structure and approach road design, final drawings, special project specifications, construction cost estimates and a construction schedule. Final design drawings shall be prepared in AutoCAD 2008 and utilize the IPNF Title Block. Consultant shall prepare all special project specifications. The specifications shall be prepared in electronic format using Microsoft Word (.doc). A 50% and 95-100% submittal will be required. After each submittal, the Forest Service will review and provide comments.
The 50% submittal shall include:

- Drawings with layout of anticipated details.
- Listing of anticipated Special Project Provisions to accompany the Forest Service Standard Specifications listed above.
- Listing of anticipated bid items based on the Forest Service Standard Specifications listed above.
- Design assumptions.
- No meeting with Forest Service Representatives is scheduled to discuss project progress. The 50% submittal can be done electronically (pdf. format) for Forest Service review and comments. ***(If a meeting is required after Forest Service review, the meeting will be conducted in Missoula at Consultant's office).***

The 95-100% submittal shall include completed Plans, Special Project Specifications and Estimates (PS&E) package. All Contractor quality control and checking shall be completed prior to the 95-100% submittal. Provide the 95-100% submittal to Brent Briggs. Allow the Forest Service 14 calendar days to review the 95-100% submittal. Final design submittals shall follow within 15 days after receiving written comments from the Forest Service.

Deliverables:

- Preliminary design submittal (50%).
- 3 sets of the 95-100% review submittal.
- 2 sets of final PS&E package, Originals (for Forest Engineer's signature) and one(1) copy to for St. Joe Ranger District project file on IPNF.
- 2 sets of design calculations, 1 to IPNF Supervisor's Office and 1 set for District Office.

- 2 sets of final design drawings, SPS's and Estimates on electronic format. One set to IPNF Supervisor's Office, the other set for District Office.

Government Furnished Items:

- Electronic files of standard special provisions in Microsoft Word (already provided).
- Stream survey data with recommended stream Q2 bank full width for design, (see exhibit 2).
- Stream flow data (Q2, Q10, Q50 & Q100), (see exhibit 2).

Project Schedule:

Road	DJ&A Design Engr./F.S. Site Visit	Preliminary Design or Alternatives	50 % Review	95 - 100% Submittal	Plans-In-Hand Review
448 - Emerald Creek	Conducted on July 24, 2008	Nov 7, 2008 Meeting in Missoula	Nov 21, 2008	May 16, 2009	Not required

Quality Control / Quality Assurance: Contractor shall be responsible for the quality and accuracy of their work.

Forest Service Review: Forest Service review of the work at the various submittals shall be for overall conformance with the project scope of work, design criteria, and generally accepted practices of design and drawing preparation.